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09/711,541	11/13/2000	Masaharu Ito	YKM-00901	7142

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EXAMINER

LEE, BENNY T

ART UNIT PAPER NUMBER

2817

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES DEPARTMENT OF COMMERCE  
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REPLY DATE:

09/711541

AK

☐ This application has been examined ☒ Responsive to communication filed on 28 Oct 2003 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire Three (3) month(s), 00 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice re Patent Drawing, PTO-948.                  |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449.                 | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152 |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474.     | 6. <input type="checkbox"/> _____   |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-16 are pending in the application.

Of the above, claims \_\_\_\_\_ are withdrawn from consideration.

2. ☐ Claims \_\_\_\_\_ have been cancelled.

3. ☒ Claims 3; 4-7; 12; 14 are allowed.

4. ☒ Claims 1, 2, 8-11, 13, 15, 16 are rejected.

5. ☐ Claims \_\_\_\_\_ are objected to.

6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed \_\_\_\_\_, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received  
☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

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**DETAILED ACTION**

The disclosure is objected to because of the following informalities: Page 1, lines 25, 26, and page 2, line 1, note that --(see Fig. 9)-- should follow “6a”, “1a”, & “1b”, respectively. Page 2, line 12, note that --(see Fig. 10)-- should follow “c-c”; line 15, note that --(see Fig. 11)-- should follow “1a and 1b”. In the replacement paragraph starting at page 5, line 26, first line therein, note that --(see Fig. 1)-- should follow “104” for clarity Page 6, lines 1 & 2, note that --(see Fig. 2)-- should follow “101a” & “101b”, respectively; line 6, note that --as shown in Fig. 2-- should follow “101b”; line 16, note that --as shown in Fig. 1-- should follow “107”. Page 9, line 15, note that --(see Fig. 3)-- should follow “w”. Page 11, line 10, note that --(see Fig. 6)-- should follow “104a” & “104b”, respectively. Note that in the description of Figs 4-8, 10, applicants’ should make sure that all reference labels appearing in the corresponding drawing should be commensurately described in the figures description. Appropriate correction is required.

The drawings are objected to because of the following: In Figs. 2, 3, note that reference labels (104,  $\lambda_{p1}$ ,  $\lambda_{p2}$ ) need to be labeled therein. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claims 1, 2, 8-11, 13, 15, 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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With regard to claims 1, 16, note that the added limitation that the “coplanar line has a discontinuous surface caused by a level difference ...” does not appear to have been supported by the original disclosure and thus must be treated as “new matter”. Note that in each disclose embodiment, the “coplanar line” (i.e. a signal line with ground planes on opposite sides of the signal line) is disposed on the first substrate (outside the cavity) and remains continuous as it passes under the second substrate to become the “inner layer line” within the cavity. Moreover, note that in none of the embodiments is “a coplanar line” constituted by a “discontinuous surface” at the “interconnection interface”.

However, if applicants’ do not believe that the above noted limitation is “new matter”, then an appropriate explanation is required, including pointing out where explicit support for the limitation in question can be found in the original disclosure.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 15, note that it is unclear, even in light of the specification, what is meant by the recitation “... is accumulated on the first dielectric substrate”. Clarification is needed.

The following claims have been found objectionable for reasons set forth below:

In claims 1, 3, 4, 12, 14, second paragraph of each claim, note that --within said cavity-- should be inserted between “substrate” and the “,” at each occurrence for clarity of description.

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In claims 2, 3, 4, note that reference to the “second ground conductor” being “on said second substrate” and the “plurality of second via holes” being “disposed in said second dielectric substrate” should be deleted-- at each occurrence since these limitations were already recited in the respective independent claims from which these claims depend.

In claim 5, line 1, note that “of” should be rewritten as --between-- & line 2, “said second via hole” should be rephrased as --said plurality of second via holes-- for a better characterization.

In claim 6, line 4, note that --are-- should precede “disposed” for a proper characterization.

In claim 8, note that --plurality of-- should precede “second via holes” for consistency of description.

In claims 12, 14, fourth paragraph of each claim, should --second ground conductor disposed on a-- precede “top surface” for a proper characterization (e.g. see claim 1)?

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 8, 9, 13, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hidaka et al in view of applicants’ admitted prior art (fig. 8).

Hidaka et al (Fig. 6) discloses an RF package comprised of a multi-layered substrate having a first dielectric layer (2A) including a cavity formed therein such as to receive an (e.g. semiconductor) element. A second dielectric substrate (2B) including a top conductive (i.e. ground) layer (4) is disposed over the first dielectric layer. A coplanar signal line is disposed on

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the first dielectric layer and includes a signal conductor (3) and ground conductors (14, 15) arranged on opposite sides of the signal conductor (3) in a common plane such as to constitute a coplanar line, as would have been known to those of ordinary skill in the art. Note that the signal conductor (3) and ground conductors (14, 15) extend from a position outside the cavity to a position inside the cavity, thereby defining a feed through arrangement whereby inner coplanar layers are provided. Moreover, note that at an outer interface of the second dielectric layer, vertically oriented metal members extend to connect the ground conductors (14, 15) to the conductive (i.e. ground) layer (4). Similarly, vertically oriented metal members (16, 17) electrically connect the ground conductors of the inner coplanar layer to conductive layer (4). As would have been evident from fig. 6, the vertically oriented metal members provide for a discontinuous coplanar line at the interface of the second dielectric substrate. However, Hidaka et al differs from the claimed invention in that conductive vias in the first and second substrates have not been explicitly disclosed.

The admitted prior art (fig. 8) discloses that conductive vias for the ground conductors of the coplanar line at the first and second dielectric substrates is conventional in the art.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have modified the package of Hidaka et al (fig. 6) to have included via connections connecting the coplanar lines ground planes of the first & second substrate such as taught by the admitted prior art (fig. 8). Such a modification would have been obvious in view of the same field of endeavor of the Hidaka et al reference and the admitted prior art (i.e. both pertain to RF packages with multi-

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layered substrate with a cavity for receiving a semiconductor device) . Note that such a modification would have been consistent with analogous packaging arrangement already provided in the Hidaka et al reference, but would have provided the advantageous benefit of providing additional grounding effects (i.e., through the added vias), thereby suggesting the obviousness of the modification.

Claims 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the preceding rejection as applied to claim 1 above, and further in view of Kennedy et al.

The above combination meets the claimed invention except for the limitation that the metal members are metal posts which are semicircular in shape.

Kennedy et al (fig. 4A) discloses that a multi-layer substrate RF package can include semicircular metal electrode members or posts (460) electrically connecting the ground plane of a coplanar line along an edge of an upper substrate (430) is considered conventional in the art.

Accordingly, it would have been considered obvious in view of the references, taken as a whole, to have substituted the semi-circular posts, as taught by Kennedy et al in place of the vertically oriented metal members as taught by the combination. Such a modification would have been considered an obvious substitution of art recognized equivalent metal members at an interface, especially since each type of metal member effects the same function with a device from the same field of endeavor, thereby suggesting the obviousness of the combination.

Applicant's arguments filed 28 October 2003 have been fully considered but they are not persuasive.

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With respect to the objection to the specification, applicants' comments have been noted, but have been found unpersuasive. It should be noted that the nature of the objections to the specification result from applicants' reference to multiple figures in a particular description (e.g. the paragraph at page 5, line 26 references Figs. 1, 2, 3). However, in the corresponding description, not all of the labeled features are described in such a collective description. Hence, the objections & corresponding suggestions seek to specifically relate labeled features to the drawing figures in which they actually appear to thus provide clarity of description.

Applicant's arguments with respect to claims 1, 2, 8-11, 13 have been considered but are moot in view of the new ground(s) of rejection.

Claims 3-7, 12, 14 are allowable over the prior art of record

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37



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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benny Lee whose telephone number is (703) 308 4902.

A handwritten signature in cursive script that reads "Benny Lee".

B. Lee

January 5, 2004